

REMARKS

Objections to the Drawings

Examiner has objected to Figure 1 because autofocus window 12 was not mentioned in the Specification. Applicant has amended the Specification to include a reference to autofocus window 12. No new matter is believed added to the case because this is an incidental detail of Figure 1 and it is well known in the art that automatic cameras usually include an autofocus feature and autofocus window.

Examiner has objected to Figure 3 because the Specification refers to "color interpretation block" 42 rather than "color interpolation block" 42. Applicant notes that the Specification refers to both "color interpretation block" 42 and "color interpolation block" 42 (see for example paragraph [0015] and paragraph [0017]). Applicant has amended the Specification to correct the typographic errors where "color interpolation block" 42 is mistakenly referred to as "color interpretation block" 42.

Rejections of the Claims

Examiner has rejected claims 1 through 20 under 35 U.S.C. § 103 (a) as being unpatentable of USPN 5,504,525 (Suzuki) in view of US 2002/0054220 A1 (Takeuchi). Applicant respectfully traverses the rejection and requests reconsideration.

Below, Applicant discusses subject matter in the independent claims 1, 8 and 15 not disclosed or suggested by the cited art. On the basis of this, Applicant believes all the claims are patentable over the cited art.

Discussion of Independent Claim 1

Claim 1 sets out a method that includes capturing an image using a color filter array, detecting a plurality of color components of light incident upon a color sensor, generating an average intensity value for each of the plurality of color components, and using the average intensity values for the plurality of color components to calculate a white balance for the image captured by the color filter array.

Examiner has conceded that Suzuki does not disclose generating an average intensity value for each of the plurality of color components, and Suzuki does not disclose using the average intensity values for the plurality of color components to calculate a white balance for the image captured by the color filter array. See the Office Action dated October 7, 2004 at page 4, first paragraph.

Examiner has argued the following:

In light of the teaching from Takeuchi, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a converter that generates an average intensity value for the plurality of color components so to reduce error created by the processing unit (Suzuki, Reference Number "130", Figure 3) before A/D Conversion (Suzuki, see Figure 3, Reference Number "109").

See the Office Action dated October 7, 2004 at page 4, second paragraph.

Examiner appears to be arguing that it would be obvious, in light of Takeuchi, to modify Suzuki to generate average intensity values of color components before A/D conversion is performed. This is clearly incorrect. It is not obvious, in light of Takeuchi, to modify Suzuki to generate average intensity values of color components before A/D conversion is performed.

Takeuchi performs averaging on 16-pixel (digital) data. See Takeuchi at Figure 2 and paragraph [0055]. The data is converted into digital data before it arrives at image pickup data input terminal 201 and thus before any averaging is performed. See Takeuchi at Figure 2 and paragraph [0053].

Takeuchi does not disclose or suggest averaging analog values but only averaging digital values. Further, it is not clear from Takeuchi even how one could perform averaging of analog values. Nothing in Takeuchi discloses or suggests to a person of ordinary skill in the art that average intensity values of color components could or should be generated before A/D conversion is performed. Takeuchi teaches the opposite. Specifically, Takeuchi teaches generation of average values of 16-pixel data after conversion to digital data has been performed.

In Suzuki, Rb/Gb and Bb/Gb are calculated before A/D conversion is performed. See Suzuki at Figure 3 and column 4, lines 50 through 52. Thus, in Suzuki generating an average intensity value for each of the plurality of color components would have to be done before A/D conversion is performed. However, nothing in Suzuki or Takeuchi discloses or suggests this, nor is it clear

from these references how average intensity values could be generated before A/D conversion.

Examiner has further argued as follows:

The error in the plurality of color components generated by the aforementioned processing unit would combine with the error inherent in A/D Conversion; hence, an inaccurate digital value for the plurality of color components would be sent into the Control Unit (Suzuki, Reference Number "110, Figure 3). The converter that generates an average intensity value for each of the plurality of color components would, in turn average out any error created in said processing unit and prevent the propagation of error through the A/D converter.

See the Office Action dated October 7, 2004 at page 4, second paragraph through page 5, first paragraph.

This argument appears to be speculation on the part of the Examiner.

Nothing in Suzuki or Takeuchi indicates that there would be any meaningful error in the plurality of color components generated by the processing unit 130 or that such an error (if it exists) would combine with the error inherent in A/D Conversion. Nothing in Suzuki or Takeuchi discloses or suggests that if such a problem did exist, the way to solve it would be to generate an average intensity value for each of the plurality of color components. It is not even clear how such an analog average could be achieved and whether performing such an analog average would result in a greater amount of error than the hypothetic error that is being compensated for.

In short, Examiner appears to be hypothesizing a problem that probably does not exist and then suggesting a solution that probably would not fix the problem if the problem did exist. All of this is done without any disclosure or suggestion from the cited references that the problem exists or if it did exist,

how the problem should be remedied. Such speculation should not serve as a basis for a rejection under 35 U.S.C. § 103.

Discussion of Independent Claim 8

Claim 8 sets out device that takes an image. The device includes a converter that generates an average intensity value for each of the plurality of color components, and includes a white balance calculator that uses the average intensity values for the plurality of color components to calculate a white balance for the image captured by the color filter array.

Examiner has conceded that Suzuki does not disclose the converter or the white balance calculator as claimed. See the Office Action dated October 7, 2004 at page 4, first paragraph.

As discussed above, Examiner has argued it would be obvious, in light of Takeuchi, to modify Suzuki to generate average intensity values of color components before A/D conversion is performed. This is clearly incorrect.

As discussed above, Takeuchi performs averaging on 16-pixel (digital) data. See Takeuchi at Figure 2 and paragraph [0055]. The data is converted into digital data before it arrives at image pickup data input terminal 201 and thus before any averaging is performed. See Takeuchi at Figure 2 and paragraph [0053].

Takeuchi does not disclose or suggest averaging analog values but only averaging digital values. Further it is not clear from Takeuchi how one could perform averaging of analog values. Nothing in Takeuchi would disclose or

suggest to a person of ordinary skill in the art that average intensity values of color components could or should be generated before A/D conversion is performed. Takeuchi teaches the opposite. Specifically, Takeuchi teaches generation of average values of 16-pixel data after conversion to digital data has been performed.

In Suzuki, Rb/Gb and Bb/Gb are calculated before A/D conversion is performed. See Suzuki at Figure 3 and column 4, lines 50 through 52. Thus, in Suzuki, generating an average intensity value for each of the plurality of color components would have to be done only before A/D conversion is performed. However, nothing in Suzuki or Takeuchi discloses or suggests this, nor is it clear from these references how average intensity values could be generated before A/D conversion.

As more completely discussed above, Examiner has made arguments as to why it would be useful in Suzuki to perform an analog average of color components. However, as discussed above, the argument appears to be pure speculation on the part of the Examiner. Nothing in Suzuki or Takeuchi indicates that there would be any meaningful error in the plurality of color components generated by the processing unit 130 or that such an error (if it exists) would combine with the error inherent in A/D Conversion. Nothing in Suzuki or Takeuchi discloses or suggests that if such a problem did exist, the way to solve it would be to generate an average intensity value for each of the plurality of color components. It is not even clear how such an analog average could be achieved and whether performing such an analog average would result

in a greater amount of error than the hypothetic error that is being compensated for. The type of speculation engaged in by Examiner should not serve as a basis for a rejection under 35 U.S.C. § 103.

Discussion of Independent Claim 15

Claim 15 sets out device that takes an image. The device includes a converter means for generating an average intensity value for each of the plurality of color components and includes a white balance means for using the average intensity values for the plurality of color components to calculate a white balance for the image captured by the color filter array.

Examiner has conceded that Suzuki does not disclose the converter means or the white balance means as claimed. See the Office Action dated October 7, 2004 at page 4, first paragraph.

As discussed above, Examiner has argued it would be obvious, in light of Takeuchi, to modify Suzuki to generate average intensity values of color components before A/D conversion is performed. This is clearly incorrect.

As discussed above, Takeuchi performs averaging on 16-pixel (digital) data. See Takeuchi at Figure 2 and paragraph [0055]. The data is converted into digital data before it arrives at image pickup data input terminal 201 and thus before any averaging is performed. See Takeuchi at Figure 2 and paragraph [0053].

Takeuchi does not disclose or suggest averaging analog values but only averaging digital values. Further it is not clear from Takeuchi even how one

could perform averaging of analog values. Nothing in Takeuchi would disclose or suggest to a person of ordinary skill in the art that average intensity values of color components could or should be generated before A/D conversion is performed. Takeuchi teaches the opposite. Specifically, Takeuchi teaches generation of average values of 16-pixel data after conversion to digital data has been performed.

In Suzuki, Rb/Gb and Bb/Gb are calculated before A/D conversion is performed. See Suzuki at Figure 3 and column 4, lines 50 through 52. Thus, in Suzuki generating an average intensity value for each of the plurality of color components would have to be done before A/D conversion is performed. However, nothing in Suzuki or Takeuchi discloses or suggests this, nor is it clear from these references how average intensity values could be generated before A/D conversion.

As more completely discussed above, Examiner has made arguments as to why it would be useful in Suzuki to perform an analog average of color components. However, as discussed above, the argument appears to be pure speculation on the part of the Examiner. Nothing in Suzuki or Takeuchi indicates that there would be any meaningful error in the plurality of color components generated by the processing unit 130 or that such an error (if it exists) would combine with the error inherent in A/D Conversion. Nothing in Suzuki or Takeuchi discloses or suggests that if such a problem did exist, the way to solve it would be to generate an average intensity value for each of the plurality of color components. It is not even clear how such an analog average

could be achieved and whether performing such an analog average would result in a greater amount of error than the hypothetic error that is being compensated for. The type of speculation engaged in by Examiner should not serve as a basis for a rejection under 35 U.S.C. § 103.

Conclusion

Applicant believes this Amendment has placed the present application in condition for allowance and favorable action is respectfully requested.

Respectfully submitted,

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